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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,610	07/07/2005	Takahiko Suzuki	4592-007	8973

22429 7590 06/11/2008

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EXAMINER	
RAINEY, ROBERT R	

ART UNIT	PAPER NUMBER
2629	

MAIL DATE	DELIVERY MODE
06/11/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,610	SUZUKI ET AL.	
	Examiner	Art Unit	
	ROBERT R. RAINEY	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21 and 26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21 and 26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/27/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The objection to the drawings is effectively overcome by the amendments to the drawings.

2. The objection to the abstract is effectively overcome by the amendments to the abstract.

3. The rejections of claims 22, 23 and 25 are made moot by the cancellation of claims 22-25.

4. Applicant's arguments with respect to the art rejections of claims 1-21 and 26 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 1, 2, 4-16, 18-21, and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 7,038,667 to *Vassallo et al.* ("*Vassallo*") in view of U.S. Patent No. 4,893,045 to *Honda* ("*Honda*").

As to **claim 1**, *Vassallo* discloses a haptic feedback controller for controlling a controlled appliance, comprising: a base (see for example Fig. 3C item 146); a cap that is rotatable with respect to the base (see for example Fig.

3C item 26); a motor including a ring-shaped stator that is fixed to the base and a ring-shaped rotor that is fixed to the cap (see for example Fig. 3C item 132 and 11:35-51, especially "...the knob 26 is directly coupled to the drive shaft of an actuator 132."); a rotation control device for controlling a rotational state of the piezoelectric motor (see for example 1:36-47); and a rotational state detecting device for detecting the rotational state of the cap with respect to the base or the rotational state of the motor (see for example Fig. 3C item 142), wherein the motor is for driving the rotor to rotate to provide haptic feedback to a user of the controller (see for example 19:4-13).

Vassallo discloses the claimed invention except for the substitution of the motor of *Vassallo* by a piezoelectric motor wherein the stator of the piezoelectric motor is in direct physical contact with the rotor, without the intermediary of gears and/or belts.

Honda discloses a rotary ultrasonic driving device (see for example 1:9-30), i.e. piezoelectric motor, and in particular: a piezoelectric motor wherein the stator of the piezoelectric motor is in direct physical contact with the rotor, without the intermediary of gears and/or belts (see for example Fig. 1 and 2:57-3:15 with an exemplary mapping of stator being items A and B and rotor being items E and F).

Vassallo and *Honda* are analogous art because they are from the same field of endeavor, which is small rotary actuator design.

At the time of invention, one of ordinary skill in the art could have substituted one known motor type, piezoelectric of Honda, for the other, electromagnetic, and the results would have been predictable.

As to claim 2, in addition to the rejection of claim 1 over *Vassallo* and *Honda*, *Vassallo* further discloses an input/output device for outputting rotational state information based on a detection result of the rotational state detecting device (see for example 3:56-4:29) and receiving an input of feedback information used for controlling the rotational state of the piezoelectric motor (see for example 5:13-15).

As to claim 4, in addition to the rejection of claim 1 over *Vassallo* and *Honda*, *Honda* further discloses that said rotor includes a sliding member in sliding frictional contact with the stator (see for example Fig. 1 item E).

As to claim 5, in addition to the rejection of claim 1 over *Vassallo* and *Honda*, *Vassallo* further discloses mechanism for changing a distance between the base and the cap in a direction in which pressure is applied (see for example Fig. 7 and 15:23-35).

As to claim 6, in addition to the rejection of claim 1 over *Vassallo* and *Honda*, *Vassallo* further discloses a bearing mechanism for rotationally

supporting the base on the cap (see for example Fig. 3C, in which it is the bearings of the motor that provide the bearing mechanism for rotational support between the base and the cap).

As to claim 7, in addition to the rejection of claim 1 over *Vassallo* and *Honda*, *Vassallo* further discloses that the rotational state detecting device includes an encoding barcode on an inner surface of the cap and a sensor unit fixed to an inner surface of the base, thereby detecting movement of the encoding barcode with respect to the sensor unit to detect the rotational state of the cap with respect to the base (see for example Fig. 3C, note that once assembled the knob 26 and motor shaft are integral and can be considered to be one unit, i.e. the cap, and the encoder disc 142, i.e. barcode, is mounted to the motor shaft surface, which is an inner surface since it is inside the unit).

As to claim 8, in addition to the rejection of claim 1 over *Vassallo* and *Honda*, *Honda* further discloses detecting the rotational state of the piezoelectric motor by analyzing a current flowing through the piezoelectric motor (see for example 1:8-30, in which the rotational states determined by the current are at least rotational force applied and not applied).

Examiner takes official notice that it was well known to measure applied currents in order to provide better control and thereby to detect the rotational state, i.e. the rotational force applied or not applied.

At the time of the invention it would have been obvious to one of ordinary skill in the art to measure the applied currents in order to better control the applied force.

As to claim 9, in addition to the rejection of claim 1 over *Vassallo* and *Honda*:

Vassallo and *Honda* do not expressly disclose that the haptic feedback controller is ring-shaped.

Examiner takes official notice that ring-shaped controls were well known to those skilled in the art at the time of the invention. Many car radios for example have ring-shaped controls surrounding a separate rotary knob.

Examiner takes official notice that through-shaft and frameless versions of both motors and encoders used when the central area of the device needed to be clear were well known to those skilled in the art at the time of the invention.

At the time of the invention, one of ordinary skill in the art could have applied known techniques in order to the device after *Vassallo* and *Honda* to produce a ring-shaped device and the results would have been predictable. A simple way to think about a version of the modification is to imagine a large shaft and then simply hollow out its center.

As to claim 10, in addition to the rejection of claim 9 over *Vassallo* and *Honda*, *Vassallo* further discloses that the base and the cap are disposed so as

to face one another with a predetermined gap between the respective outer circumferential parts thereof, and said controller further comprises a plurality of contact switches disposed apart from one another in a circumferential direction on at least one of the outer circumferential parts (see for example Fig. 1 items 32 and 26 with the base/cover representing an outer circumferential part).

As to claim 11, in addition to the rejection of claim 9 over *Vassallo* and *Honda*, *Vassallo* further discloses a plurality of contact switches disposed apart from one another in a circumferential direction on an inner circumferential surface of the haptic feedback controller (see for example Fig. 1 items 32 and 26; in this case the inner circumferential surface would be an inner circumferential surface of the base/cover).

Examiner's note: Claims 10 and 11 do not necessarily represent different configurations as claimed.

As to claim 12, in addition to the rejection of claim 1 over *Vassallo* and *Honda*:

Examiner takes official notice that adding a non-slip member to the bottom surface of the base of a user input device was well known to those skilled in the art at the time of the invention as was their function, which was to increase the

friction between the device and the surface upon which it rested. Examiner personally used both trackballs and joysticks with non-slip members attached.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to add a non-slip member if addition friction was desired.

As to claim 13, in addition to the rejection of claim 1 over *Vassallo* and *Honda*, *Vassallo* further discloses a control unit for controlling the piezoelectric motor, when the user has rotated the cap, to maintain said changed rotational state (see for example 1:45-47 especially "detents").

As to claim 14, in addition to the rejection of claim 1 over *Vassallo* and *Honda*, *Vassallo* further discloses a control unit for controlling the piezoelectric motor, when the user has rotated the cap, so that the rotor moves in a direction away from the stator (see for example 1:45-47 especially "detents"; note that when the user rotates the knob out of a detent area the resistance to rotation is decreased, which can be accomplished for a piezoelectric motor by decreasing the force between the stator and the rotor or in other words the rotor moves in a direction away from the stator; an alternate interpretation upon which the claim also reads is that the way the piezoelectric motor produces motion is by moving the rotor and stator rapidly together and apart).

As to claim 15, in addition to the rejection of claim 1 over *Vassallo* and *Honda*, *Vassallo* further discloses a control unit for controlling the piezoelectric motor, when the user has caused a change in the rotational state of the cap, to maintain said changed rotational state (see for example 1:45-47 especially "detents").

As to claim 16, in addition to the rejection of claim 9 over *Vassallo* and *Honda*, *Vassallo* further discloses a control unit for electronically controlling the piezoelectric motor in different operation modes to produce different kinds of sound and/or vibration and/or resistance to rotation of the cap (see for example 1:45-47 especially "detents", i.e. different resistance to rotation of the cap).

As to claim 18, in addition to the rejection of claim 2 over *Vassallo* and *Honda*, *Vassallo* further discloses that the input/output device includes an input/output power interface that can obtain a power supply from the controlled appliance (see for example 18:48-53, with power from an interface bus being power from the controlled appliance).

As to claim 19, in addition to the rejection of claim 2 over *Vassallo* and *Honda*, *Vassallo* further discloses that the input/output device includes an input/output wireless interface for wirelessly exchanging information with the controlled appliance (see for example 4:23-27).

As to claim 20, in addition to the rejection of claim 1 over *Vassallo* and *Honda*, *Vassallo* further discloses that the rotation control device and the rotational state detecting device are entirely disposed in a space formed between the base and the cap (see for example Fig. 3C; note that both the rotation control device 132 and the rotation state detecting device 142 are entirely disposed in the space between the cap 26 and the base 146).

As to claim 21, in addition to the rejection of claim 1 over *Vassallo* and *Honda*, *Vassallo* further discloses a combination of a haptic feedback controller and a controlled appliance, wherein the controlled appliance is one of a PC, a household electrical good, a game system, a toy, a content editing appliance, a means of transport, a machine tool, and a medical tool (see for example 3:56-4:29).

As to **claim 26**, *Vassallo* discloses a haptic feedback controller for controlling a controlled appliance, comprising: a base (see for example Fig. 3C item 146); a cap that is rotatable with respect to the base (see for example Fig. 3C item 26);

a motor (see for example Fig. 3C item 132) that includes a ring-shaped stator with a ring-shaped body and a ring-shaped rotor (one of ordinary skill would assume that they are ring shaped given the cylindrical figure and

knowledge of rotary motor construction), each of the stator and rotor defining a cavity through which a rotational axis of the cap passes (see for example Fig. 3C noting that the axis of rotation for cap 26 is coincident with the motor shaft, which passes through the motor; the cavity can be for example the area taken up by the shaft or the area between the stator and the rotor), and allows the cap to rotate with respect to the base (both the shaft and the gap between the stator and the rotor contribute to the ability of the cap to rotate with respect to the base);

a rotation control device for controlling a rotational state of the motor (see for example 1:36-47); and

a rotational state detecting device disposed between the cap and the base for detecting the rotational state of the cap with respect to the base or the rotational state of the piezoelectric motor which rotates in a circumferential direction centered around the rotational axis (see for example Fig. 3C item 142, which is located between the cap and the base both in functional and physical layout).

Vassallo discloses the claimed invention except for the substitution of the motor of *Vassallo* by a piezoelectric motor that also provides the claimed features.

Honda discloses a rotary ultrasonic driving device (see for example 1:9-30), i.e. piezoelectric motor, and in particular:

a motor (see for example Fig. 3C item 132) that includes a ring-shaped stator with a ring-shaped body and a ring-shaped rotor (see for example Fig. 1

and 2:57-3:15 with an exemplary mapping of stator being items A and B and rotor being items E and F), each of the stator and rotor defining a cavity through which a rotational axis of the motor passes (see for example Fig. 1 and 2, which show a circular central open cavity);

Vassallo and *Honda* are analogous art because they are from the same field of endeavor, which is small rotary actuator design.

At the time of invention, one of ordinary skill in the art could have substituted one known motor type, piezoelectric, for the other, electromagnetic, and the results would have been predictable.

7. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 7,038,667 to *Vassallo et al.* ("*Vassallo*") in view of U.S. Patent No. 4,893,045 to *Honda* ("*Honda*") and further in view of "An Introduction to Piezoelectric Motors", by Gordon Cook, Sensors Magazine, 1 December 2001, pages 1-7 as captured for reference ("*Cook*").

As to claim 3, in addition to the rejection of claim 1 over *Vassallo* and *Honda*:

Vassallo and *Honda* do not expressly disclose a shock absorbing member is provided between the base and the stator and/or between the cap and the rotor.

Cook discloses a shock absorbing member between the base and the stator (see for example "Preloaded Springs" in Fig. A on page 3 of 7).

Vassallo as modified by *Honda* and *Cook* are analogous art because they are from the same field of endeavor, which is piezoelectric actuator design.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to provide a shock absorbing member between the base and the stator. The suggestion/motivation would have been to provide advantages such as to produce and maintain an appropriate normal force level (see for example *Cook* page 4 of 7).

8. **Claim 17** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 7,038,667 to *Vassallo et al.* ("*Vassallo*") in view of U.S. Patent No. 4,893,045 to *Honda* ("*Honda*") and further in view of U.S. Patent Application Publication No. 6,066,2255 to *Lopes* ("*Lopes*").

As to claim 17, in addition to the rejection of claim 1 over *Vassallo* and *Honda*:

Vassallo and *Honda* do not expressly disclose a plurality of light sources disposed apart from one another in a circumferential direction of the controller.

Lopes discloses a controller with a plurality of light sources disposed apart from one another in a circumferential direction of the controller (see for example Fig. 2 and 1:9-25).

Vassallo as modified by *Honda* and *Lopes* are analogous art because they are from the same field of endeavor, which is rotary user interface design.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to provide the device after *Vassallo* and *Honda* with a plurality of light sources disposed apart from one another in a circumferential direction of the controller as taught by *Lopes*. The suggestion/motivation would have been to provide advantages such as to indicate functions or knob position (see for example *Lopes* 1:20-25).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT R. RAINEY whose telephone number is (571)270-3313. The examiner can normally be reached on Monday through Friday 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amare Mengistu can be reached on (571) 272-7674. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RR/

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Supervisory Patent Examiner, Art Unit 2629